

REMARKS

Claims 19-44 are pending.

Applicants thank Examiner Shah for conducting the kind and courteous discussion with Applicants' representative, Daniel R. Evans, on November 15, 2004. The content of the discussion is contained herewith.

An aspect of the present invention is directed to increasing the lifespan of inkjet recording heads and the like, as the chemical components of ink can react with the recording head components. The interaction of the chemical components of the ink with the components of the recording head can result in dissolution of the material components of the recording head (page 5, prenumbered lines 3-9), which can contribute to a reduction of the lifespan of said recording heads (page 4, prenumbered line 4). This dissolution problem is also accompanied by a "faulty-ink-discharging problem," a "nozzle-choking problem," and the so-called "kogation" problem (page 7, prenumbered lines 16-21 and page 13, prenumbered lines 9-24).

Accordingly, an aspect of the present invention is to provide a solution to the above-noted problems by claiming an inkjet recording method discharging an ink from a nozzle of a recording head containing the ink in an ink room to form an ink image on a recording material, wherein the recording head comprises: the nozzle; the ink room containing the ink to be discharged; an ink-flow-regulating portion regulating flow of the ink to the ink room; a vibrating plate vibrating to discharge the ink from the nozzle, and wherein the ink comprises: a colorant; and a solvent, wherein a zeta potential  $\geq 2$  between the colorant and any one or more of the materials constituting the nozzle, the ink room, the ink-flow-regulating portion and the vibrating plate is from 0 to -50 mV at a pH of from 6.5 to 11.5.

The rejection of claims 19-20 and 24-29 under 35 U.S.C. § 102(e) over the disclosure of U.S. Patent No. 6,460,989 (hereinafter referred to as US '989) is respectfully traversed.

US '989 does not describe an inkjet recording method as claimed in claim 19, "wherein a zeta potential 2 between the colorant and any one or more of the materials constitute the nozzle, the ink room, the ink-flow-regulating portion and the vibrating plate is from 0 to -50 mV at a pH of from 6.5 to 11.5."

It is true that US '989 provides a lengthy discussion in pH and zeta potential (see col. 11, *ℓ.* 49, – col.12, *ℓ.* 60); however, the zeta potential described by US '989 refers to the ink itself, not the zeta potential between the "colorant and any one or more of the materials," (see claim 19).

This is in contrast to that which is presently claimed. The zeta potential recited in the pending claims measures a different observable than that referred to in US '989. The Examiner's attention is directed to the text on pages 17 and 102, which discusses that the "zeta potential 2" is a measure of the potential differences between the colorant and anyone or more of the materials constitute the nozzle, the ink room, the ink-flow-regulating portion and the vibrating plate is from 0 to -50 mV at a pH of from 6.5 to 11.5. Additionally, the Examiner's attention is directed to Figures 6A, 6B, and 6C that show diagrams of the "zeta potential cell" employed to measure "zeta potential 2" values.

Accordingly, US '989 does not anticipate claims 19-20 and 24-29. It is respectfully requested that the Examiner withdraw this rejection.

In the matter of obviousness, it is believed that the disclosure of US '989 does not render claims 19-20 and 24-29 obvious. Nowhere in US '989 is there a suggestion that the problems outlined above (i.e., nozzle-choking problem, dissolution problem, etc.) can be remedied by controlling the zeta potential "between the colorant and any one or more of the materials," as claimed in claim 19. In fact, it would appear that US '989 does not recognize these problems in the context of having a particular zeta potential range as noted in claim 19. US '989 does describe problems associated with nozzle clogging, but attributes this problem

in terms of the drying of the ink in and around the nozzle region and its problems associated with ink deposition on a substrate (see col. 1, *ll.* 27-41). Given the fact that US '989 does not recognize that the above-noted problems can be solved by maintaining a zeta potential, as described in claim 19, it is believed that the claimed invention is unobvious in view of its disclosure. It is kindly requested that the Examiner acknowledge the same and deem these claims to be unobvious in view of this reference.

The rejection of claims 36-39 and 43-44 under 35 U.S.C. § 102(e) over US '989 is respectfully traversed. Additionally, the rejection of claims 36-39 and 43-44 under 35 U.S.C. § 103(a) over US '989 is respectfully traversed.

As noted above, US '989 does not describe the characteristics in which the zeta potential between the colorant and at least one of the materials is from "0 to -50 mV at a pH of from 6.5 to 11.5" (see claim 36). Rather, US '989 only describes the zeta potential of the ink. Given that there is no description of the zeta potential characteristic as noted in claim 36, there can be no anticipation of claim 36, and claims dependent thereon, by the disclosure of US '989.

As noted above, there is no suggestion to arrive at the zeta potential difference, with respect to any of the claims. Furthermore, there is no suggestion that the above-noted problems of nozzle-choking and dissolution can be remedied by maintaining the zeta potential between the colorant and the material as described in claim 36. Accordingly, it is believed that US '989 does not render claims 36-39 and 43-44 obvious. It is kindly requested that the Examiner acknowledge the same and withdraw this rejection.

The rejection of claims 21-23 and 40-44 under 35 U.S.C. § 103(a) over US '989 in view of U.S. Patent No. 4,700,203 (hereinafter referred to as US '203); is respectfully traversed.

As noted above, US '989 does not describe or suggest that the range of the zeta potential between the colorant and the material (see claims 19, 36, and 38).

This missing element is neither described nor suggested by US '203.

US '203 is directed to inkjet heads and the like and is concerned with the manner in which ink is ejected from an inkjet head (see col. 2, *ll.* 9-18). However, there is neither a description nor a suggestion contained in US '203 which would lead one of ordinary skill to arrive at the zeta potential characteristic as described in claims 19, 36, and 38). It is respectfully requested that the Examiner acknowledge the same and withdraw this rejection.

The rejection of claims 30-35 under 35 U.S.C. § 103(a) over US '989 in view of U.S. Patent No. 5,882,390 (hereinafter referred to as US '390) is respectfully traversed.

As noted above, we know that US '989 does not provide a describe or a suggestion of the zeta potential characteristic as described in claim 19 and those claims dependent thereon.

As in the case of US '203, US '390 fails to describe or suggest the missing element.

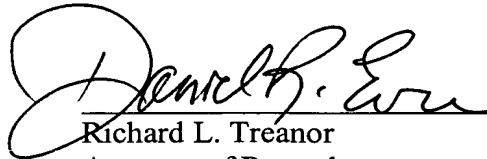
It is true that US '390 is directed to a recording ink composition and a recording method using the same. It is also true that US '390 recognizes that nozzles of inkjet recorders can become easily clogged (see col. 1, *ll.* 51-63). However, US '390's disclosure is directed more to the composition of the ink rather than the problems created by the ink. In the absence of a suggestion of the zeta potential characteristics as recited in claims 19 and claims dependent thereon, it is believed that there can be no obviousness in view the combined disclosures of US '989 and US '390. It is respectfully requested that the Examiner acknowledge the same and withdraw this rejection.

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Reply to Office Action of October 22, 2004

In view of the comments contained herewith, it is believed that the application is in a condition for allowance. Should the Examiner deem that a personal or telephonic interview would be helpful in advancing this application toward allowance, he is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Richard L. Treanor", is written over a horizontal line.

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